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CIVIL
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CAREERS FOR
GRADUATES IN

ENGINEERING

WITH THE GOVERNMENT OF CANADA



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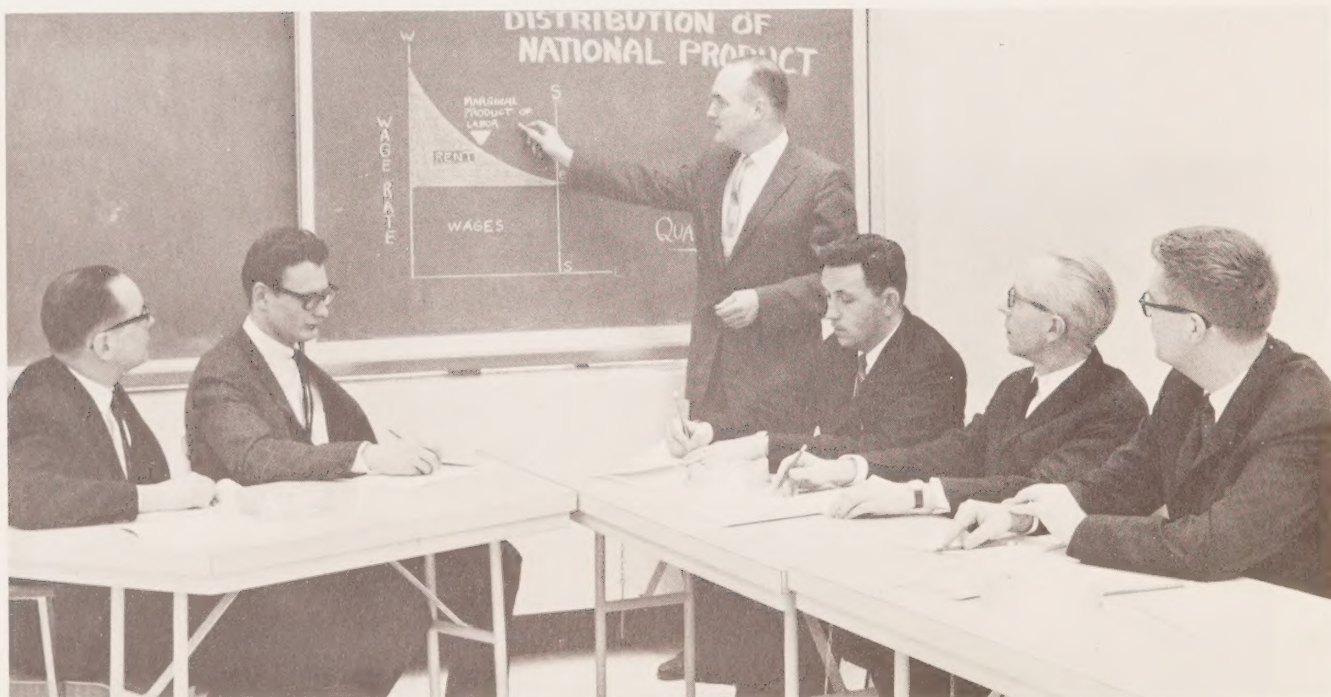
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Duncan Hay, B.Eng., UBC 1964, checks design of Harbour Improvement scheme for Westview, B.C. by Harbours & Rivers Engineering Branch of the Department of Public Works.



Engineers of the Department of Defence Production participating in a departmentally sponsored training session.

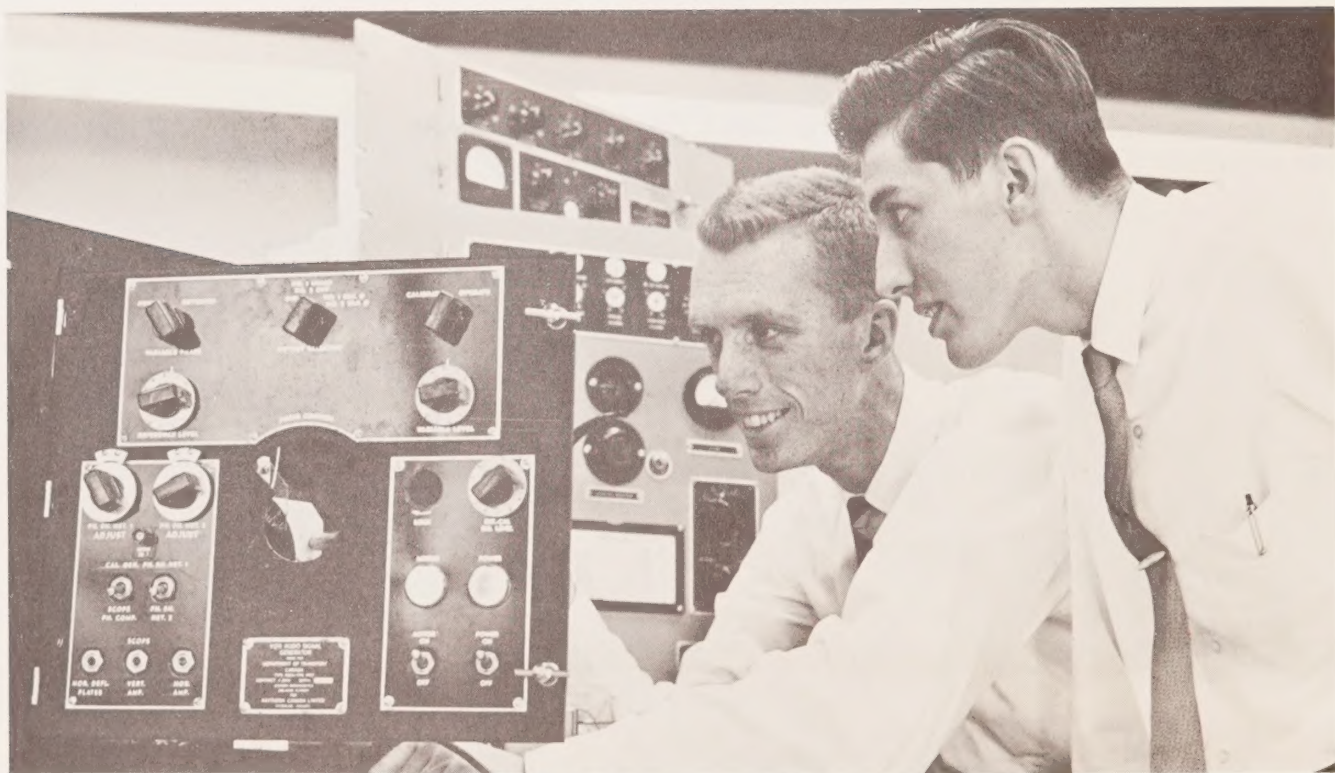
Foreword

The Government of Canada needs creative young engineers to grapple with the unique problems of our national development. This development requires resourceful engineers who can discover new methods and put them to use. It calls for engineers who want freedom and challenge to bring out their best.

This booklet will tell you about some of the challenges and some of the opportunities for the engineer with the Government of Canada. Some of the facts will be familiar; some of them may surprise you.



Marven D. Sellick, a 1964 UNB graduate in Civil Engineering; employed in the Saint John office of the Harbours and Rivers Engineering Branch of the Department of Public Works of Canada. Marven is studying plans dealing with a dredging project in Bathurst. Rolls of exposed echo sounder film may be seen in the foreground.



Ken Peal, B.Eng. (E.E.), McMaster, 1961, and Dave Challes, B.Sc. (E.E.), Manitoba, 1965, developing a modification to a VOR navigational aid.

Why the Government Needs You

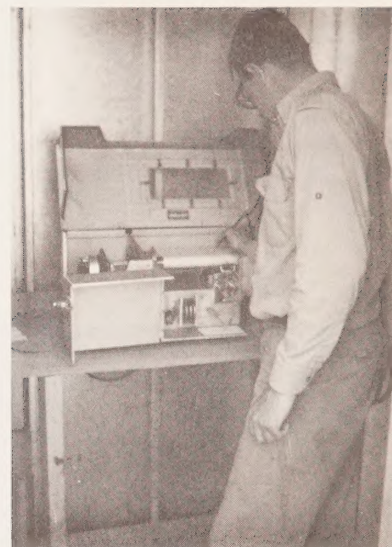
Today, the complex facets of our national development and our international activities have opened new avenues for engineering skills and initiative. The government engineer is responsible for the development of long-term plans in our national interest. As a result, he is dealing with complex situations that demand originality and foresight. He is helping to shape Canada's future. He participates in a variety of projects ranging from the International Hydrologic Decade, to designing breakwaters such as that at Baie-Comeau; from planning and carrying out the \$10 million program for Canadian air fields and facilities, to working on complex air conditioning and humidity control devices.

Because these challenges and responsibilities are likely to increase, the government service needs more far-sighted engineers who have the necessary academic qualifications and who can accept challenges and responsibility.

If you are prepared to accept responsibilities early in your career; if you have initiative and resourcefulness; if you think you could co-ordinate, integrate, and carry out a variety of activities; you may be one of the engineers your government needs now.



Karl Lenz, B.Eng., 1964 Saskatchewan, examines core sample at the Soils Laboratory of the Prairie Farm Rehabilitation Administration at Saskatoon.



R. A. Halliday, UBC, 1964, of Water Resources Branch, Northern Affairs and National Resources, calibrating graph of stream flow obtained on an automatic data recorder.



D. W. Kirk, Queen's and F. M. Sullivan, UNB, engineers of Water Resources Branch fixing the height above sea level of a stream gauging station.

The Work

Canada's physical geography and population pose unique problems for the engineer, in communications, transportation, industrial development and resource evaluation and development. Civil, electrical and mechanical engineers work in the broad areas of construction, design, operations, maintenance, and administration usually in co-operation with other government agencies, private industry, and international organizations. The following examples will show you a cross section of the fields of endeavour in the government that are open to you.

The jet age development may excite your interest. Canada must have new air fields and facilities. New air terminal buildings must be built. In the next 10 years, \$10 million will be spent on runways alone. Rapid changes in national and international needs have brought new requirements for advanced equipment and facilities in both the mechanical and electronics fields.

Activity in the development of programming systems for satellite tracking has started. Electronics graduates will have the opportunity to cope with computer programmed systems, control systems and systems simulation. A group of engineers specializing in this area has recently been formed by the Department of Transport in Ottawa. Construction of these satellite tracking stations taking place of the next few years will present the civil engineer with unique and precise foundation studies. Automation of air traffic control, planning and licencing of communication facilities are two other examples of development in this field that may interest you.

Construction of port and harbor facilities for the Department of Public Works, or the development of inland waterways for the Department of Transport may be more in your line. Two examples of design and construction are the Baie-Comeau breakwater which was fully developed in Canada and has been internationally acclaimed, and the unique ice dam being built to protect the World's Fair site in Montreal. The latter consists of concrete piers and gates upstream from the site and is the first attempt to control ice jams other than by blasting.

If you are interested in engineering administration you may start your career with the Department of Defence Production in the negotiation and supervision of contracts for equipment for all the armed forces.

Or you may want to work in the field of geodasy or topographic surveys with the Department of Mines and Technical Surveys, a section of the government whose work forms the basis for all surveying and mapping in Canada and helps make the most of our natural resources. Several long term projects have been initiated as a result of the use of modern and sophisticated surveying techniques. The use of aerodist equipment in the geodetic field is now underway in an area leading from the northern tip of Quebec to Baffin Island. This area was formerly inaccessible for work to geodetic accuracy. The same type of work will be carried out in all other parts of Canada where the terrain is difficult, as it is for example, in Northern Ontario. In similar ways photogrammetric methods are being used

by legal surveys for a greater degree of accuracy. It is now possible to establish accuracies to about two inches. Early projects were very successful and more use will be made of this method.

A lengthy program of topographic surveying has started to revise map coverage to one mile to the inch, particularly in settled areas. Completion of this project will probably take several decades.

There are many opportunities for electrical and mechanical engineers in research and development engineering on the instrumentation design staff at the Bedford Institute of Oceanography. The institute is pioneering in the field of oceanographic engineering and instrumentation required by research scientists puts a great demand on advanced engineering know-how. The institute is virtually the only organization of its kind in Canada, and one of the few in the world. Its vessel 'The Hudson' is regarded as the finest oceanographic ship in the world. Complex automatic ship borne data logging systems and the design of moored buoys typify some of the engineering work carried out.

You may wish to be associated with Canada's part in the program of the International Hydrologic Decade which will require a large scale participation by civil engineers through hydrologic investigation and evaluation of Canada's water resources. An extensive study is being made of the Great Lakes, as a part of Canada's responsibility in the International Hydrologic Decade. This survey of the effects of high and low water on shore properties and marine structures will lead to the

design of river regulation and short protection structures. This and other contributions will be extremely significant parts of the global program.

Fish culture development, patent examination, acceptance testing, export trade promotion, soils mechanics, automated meteorological instrumentation, restoration of historic sites, are but some of the other areas in which government engineers contribute their vital functions.

How You Start

How will you fit in as a new graduate?

Naturally, you will want to supplement your training with engineering experience. How you do this will depend to some extent on your choice of activity and your plans for your long-term career development. You will begin your career with intensive training to acquaint you with the particular aims, responsibilities, and criteria of the department that you join. Then you will develop your skills. Generally during the first four to six years of your career you will be in training under varying degrees of guidance while you mature as a professional engineer. You will work with top calibre members of your profession, many of whom have received international recognition, and you will associate with equally qualified fellow professionals in industry. You will have ample scope for your ability, energy, and ambition. You will also have access to a wide range of advanced test and design equipment.

As part of your career development you may be sent on government courses, on courses given by industrial firms, and on plant visits. You may be returned to university for further study with financial assistance. The circumstances under which you will participate in some or all of these schemes of training will vary. The nature of your work will be a factor, as will the departmental needs at a given time. Two other important factors will be your ability and your wishes.

Your Career Advancement

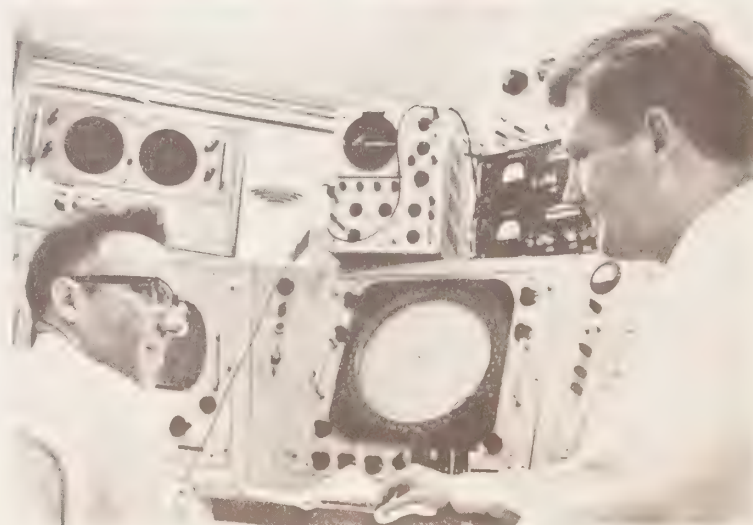
You will soon find that you have a great deal of control over your career development. Whether you choose to work in a district office of a department or in departmental headquarters in Ottawa; whether you choose design or maintenance engineering, your advancement to other areas of work and to positions at higher levels will depend on you. The responsibilities you are given will be related to your ability. You may find your first choice of activity was the right one, or you may find your experience directs you to other engineering activities. In any case, you will have the opportunity not only to be transferred or promoted within your department but for jobs anywhere in the civil service as vacancies occur or as new positions are created. All transfers and promotions are made on the basis of a merit system, which means a down-to-earth evaluation of a person's experience and qualifications, and not on the basis of seniority.

As your career develops you may work in a technical role, in administration, in contract negotiations, in operations, in management analysis, or in any field best suited to you. No matter where you move within the service, your benefits such as pension contributions, sick leave, and vacation leave move with you and continue to accumulate.

Ron Young, B.Eng., Mount Allison, 1964, evaluating a Marine Loran unit to ensure that engineering modifications are meeting the specifications.



Gerry Scott, B.Sc. (E.E.), Alberta 1960, and Don Chilibeck, B.Sc. (Eng. Physics), Alberta 1960 and a Master's degree from Purdue 1961, discuss the design parameters of a weather radar unit being installed in a mobile facility.



Salaries

Salaries of engineers in the government service are usually increased annually, and adjusted periodically by review on the basis of national averages.



Benefits

The benefits are many and varied. Among these are 10 holidays a year plus three weeks' vacation. You will earn 15 days of sick leave each year and if unused it will accumulate from year to year. There are also other types of leave including examination, court, and military leave. You will be enrolled in one of the most comprehensive superannuation plans in Canada and will have low cost term insurance. The pension under this plan can be as much as 70 per cent of your average salary over a six year period of highest earnings. If you wish, you may enroll in an excellent surgical medical plan. In some locations there are civil service credit unions which you may join.

Roger Baldwin, B.Eng. 1962 Saskatchewan, construction engineer with the Prairie Farm Rehabilitation Administration examines site survey at the South Saskatchewan River Dam Project.

Interested

Your career with the Government of Canada can be a rewarding one. It will be challenging and creativity is encouraged. There will be good training programs, excellent opportunities for advancement based on your merit, and recognition for your achievements. This career also offers a chance to work for the orderly development of our country and to ensure that the highest calibre of engineering standards are maintained in that development.

Unfortunately this brochure does not give you a complete insight into the satisfactions you can achieve through a career with the Government of Canada.

If you are interested, you can explore a little further, by speaking to those who can give you first hand information; the people who have made successful and

satisfying careers in the civil service. Whenever possible each autumn an application form and information about employee opportunities the following spring are mailed to engineering undergraduates in their final year. Shortly afterwards, a representative from the government's central personnel agency, the Civil Service Commission, and several engineers from various departments will visit your campus for discussions and interviews. Announcements concerning this visit will be placed on your placement office bulletin boards and in the university and local newspapers.

If you are working on a post-graduate degree or have had professional experience, there may be positions open to you today. Your inquiry can be sent to the Staffing Branch, Civil Service Commission, Ottawa 4.

Other Information

This booklet is one of a series prepared for university students. The others are:

- Physical Sciences
- Biological Sciences
- Junior Executive Officers and Foreign Service Officers
- Medical Sciences, Dietetics and Social Work
- Library Science
- Law
- Business Administration, Commerce, Economics and Finance

Copies may be obtained from your University Placement Office or from any office of the Civil Service Commission.

Scientific Research

Pamphlets describing current research activities in departments of the federal Government are also available in the following fields:

- Physical and Inorganic Chemistry Research
- Physics Research
- Chemistry Research in the Biological Sciences
- Entomological Research
- Bacteriology

Copies may be obtained from your University Placement Office or from any office of the Civil Service Commission.

Summer Employment

The Government service begins its search for prospective employees long before they graduate. Each summer it employs students to work in its departments. In most instances the students receive travel assistance. Those working in the field receive allowances besides salary.

For further information and application forms, contact your University Placement Office. Please note that applications must be submitted before the last day of January.

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